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AUTHOR	Schoppmeyer, Martin W.; And Others
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ABSTRACT

To explore and document the status of computer use in Arkansas, a survey was sent to each of the 310 school superintendents in the state, and 221 surveys were returned. Results indicated that only a minority of the schools had a computer in every room; these tended to be placed in lower grade classrooms. Excepting kindergarten, the majority of schools had computer labs at every grade level. Access to the Internet was not widespread; a majority of the school districts provided it only for grades 10-12. A majority of the school personnel reported that they were familiar with the Internet and most reported ease in attaining Internet resources. Responses varied in terms of specific online searching programs (Netscape, Fetch, Mosaic, and Gopher); and respondents were most familiar with Gopher. The majority of responses indicated some familiarity with electronic mail, although most respondents indicated "not at all" to use of e-mail at home. School district use of e-mail was far and above personal utilization. Seventy-four percent of respondents reported some familiarity with the Arkansas Public School Computer Network (APSCN), which began as an administrative function to link school districts and was expanded to include many more applications and functions. Only about 30.7% of the respondents claimed knowledge of an Internet homepage. Some 77% agreed that they would like to communicate with other school districts over the Internet. When questioned if they knew what a listserv was, only one-third of the superintendents indicated familiarity. Just over 60% of respondents reported that their library was computerized and just over half responded that hourly personnel were qualified to provide Internet use instruction. Approximately 86.46% of superintendents agreed on the importance of the Internet. The survey indicates that use of computers in Arkansas is widespread and that the state compares favorably with national trends. (AEF)

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ED 409 006

THE STATE OF COMPUTERS IN THE STATE OF ARKANSAS

Introduction

Ever since Sputnik in the late fifties and perhaps even earlier, schools have been regaled with innovations purported to revolutionize and improve them. The list has included Educational Television, Modern Math, Biological Science Study Commission (BSCS), Chem Study, Madeline Hunter, Bilingual Education, and more assorted reading "improvements" than can be recollected. The list goes on and on. The most recent addition to the collection is Technology. According to Dede (1990), electronic devices and electronic schools will transform the very nature of the learning/teaching practices that have been commonplace for centuries (pp. 39-40).

Background

To date, schools have been moving into the technological world. The progress differs considerably among states; some have moved further than others. In Arkansas, a number of years ago, the idea of Gemis developed. Gemis was to link the administrative functions of each school district to a central computer in Little Rock through a statewide computer network. As Gemis evolved, its progeny became known as the Arkansas Public School Computer Network, or APSCN. What is now history, seemingly old history, is that the original idea for an administrative network linking all school

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districts expanded into a statewide network linking a great many teachers, students, and administrators together in the state of Arkansas. The network that started as an administrative function added e-mail and telnet file access, Gopher, an easier form of file access, and eventually the graphic, audio, and print network browsing tools such as Netscape which are available today.

Concurrently and perhaps consequently, a wave of new technologies swept quickly through some areas of Arkansas but more slowly in others. But in most cases the advent of APSCN encouraged committees, school boards, parents, teachers, and administrators to think more seriously about technology. State, regional, and national publications have provided documentation about the development of APSCN and increased use of media by the state schools. By reviewing such publications it is possible to understand that progress in Arkansas is comparable to, or in some cases, is ahead of other states particularly in the area of statewide networks.

The Computer in the Curriculum

If there is an epidemic in education, it is the computer. School districts are allocating inordinate sums of monies to have their districts part of the technocratic elite. Stoll (1995) in Silicon Snake Oil argues,

> Elementary and high schools are being sold down the networked river. To keep up with this educational fad, school boards spend way too much on technical gimmicks that teachers don't want and students don't need (p. 11).

All of this is in the name of educational reform. "Because many reformers view technology as the vital link from the classroom to the workplace, technology serves as a cornerstone of virtually every reform package in America" (Baines, 1997, p. 494).

What exactly is the role of the computer in the school? How are schools implementing technology into the curriculum? Baines (1997) in his article entitled "Future Schlock" which appears in the Phi Delta Kappan, argues that

> A rationale for the integration of technology into the curriculum has always been that electronic media such as computers will give students access to more and more information (p. 494).

Granted, computers have a wealth of information and, when connected to the Internet, it would seem that the possibilities are endless. What are the school districts on average doing with all of this information and equipment? According to Mehlinger (1996) in his article "School Reform in the Information Age" which appears in Phi Delta Kappan, he contends "computers in elementary schools continue to be used heavily to teach basic skills, and this pattern is growing in high schools" (p. 403). Mehlinger also contends "Much technology is used for remediation, especially in the elementary grades; it provides drill-and-practice exercises that are boring for teachers to teach" (1996, p. 406). Mehlinger again focuses on the use of technology in the schools. "Other schools are using the technology to provide students with productivity tools, such as word processing and spreadsheets, to inspire students to make their work more professional in quality and appearance" (1996, p. 406).

Evidently the idea of a student being computer literate has different meanings for different school districts. Stoll (1995) points out,

> To one person, computer literacy means that a student can type on a keyboard. Another sees it as the ability to use standard tools to send, copy, or delete files. A third expects students to be able to write a simple program in BASIC (pp. 131-132).

Technology is a delivery system and is a curriculum content delivery system, much the same as books and other traditional media, such as films and videos. As we examine the state of technology in the State of Arkansas, we must consider how technology conveys curriculum content. But we must question what technology does to the shape of the curriculum.

> Parents walk away from schools satisfied if they merely see computers in the classroom. Principals plead for budgets large enough to bring interactive media into their schools. Many teachers are cowed by consultants sporting fancy degrees. School board members apply for grants to bring networks into local districts. Lost in this promotion are students (Stoll, 1995, p. 133).

Computers change the method of learning. Going from a lead based word processor to a phosphorous based word processor drastically changes the learning process and the transference of knowledge. This problem is only exacerbated, when according to Mehlinger (1996),

> . . .the existence of a particular technology does not prescribe the way in which it will be used. Yet how a technology is actually used is critically important. One English teacher might use computers mainly for drill on grammar and spelling, while another English teacher

might allow students to use the computers for word-processing (p. 404).

Implementation of the technology into the curriculum can vary vastly from teacher to teacher resulting in a significant difference in student achievement and participation. Computers not only change the method of instruction, they change the method of test taking. How many computers have the ability to grade an essay? Computers are limited to right and wrong answers. This limits the students ability to be creative and go beyond the lines in answers to questions, by not allowing students to formulate and deliver complete, creative answers to complex problems. Stoll (1995) asserts, "Computers emphasize test scores, rather than accomplishment" (p. 126). The notion of partial credit is not possible using a computer. In math class, the method is as important as the final answer. Partial credit is given for the proper steps taken to reach an answer. This problem is only magnified by allowing sophisticated computer systems to administer nationally standardized exams such as the SAT and the GRE.

> Every year, the Scholastic Aptitude Test asks graduating high school students "Which of these sentences is wrong?" They don't ask them to write an essay explaining how the European parliamentary form of government differs from the American congressional system or the Canadian parliamentary.
>
> No, that problem has no right or wrong answer. It measures how well a student knows the subject. Gives her a forum to express an opinion or tell a story. Tells her about her ability to cogently express herself. The testing computers can't even read these answers, let alone score them (Stoll, 1995, p. 127).

Enframement

Technology can dictate how classrooms are set up and how the curriculum is taught. Computers enframe the user, because the tool no longer is the computer, the user becomes the tool. The user has in effect, become enframed by the technology which was supposed to increase the users productivity--or the test scores of students.

"Technology may be seen as a design process that organizes people, activities, and materials" (Swartz & Hatcher, 1996, p.43). School districts should be held accountable to this. Computers may enframe the teacher and the student. Stoll (1995) states

> Alone behind a computer, a user needn't interact with anyone in the room. Since keyboards can't be shared, social interactions increasingly take place over the wires (p. 137).

Computers could eliminate any amount of cooperative learning in the classroom if software is not deliberately chosen to encourage cooperative learning. Teachers should not be second to the bits and bytes of information floating across a phosphorous screen. A classroom full of 28 students, behind 28 monitors closed off to the rest of the class by 28 sets of headphones is an eerie sight. Instruction takes on a new perspective. The teacher is not necessarily the central figure in the room. We are interested in how many of Arkansas's public schools use computers in the schools, are connected to the Internet and have qualified persons implementing the technology.

President Bill Clinton in his Goals 2000 proposes that every classroom in America will be connected to the Internet. These

are our current findings as to the state of technology in the State of Arkansas.

Method of Data Collection

To explore and document the current status of computer use in Arkansas as a whole, a survey was sent to each of the 310 school superintendents in the state. Of these, 221 were returned for a rate of 71.3 percent. The survey was a modified Likert Scale, which contained a few single answer questions, and one open-ended fill in the blank.

Results of the Survey

The initial section of the survey was on computer placement. Only a minority of schools had a computer in every classroom. Of these, there seems to be a tendency to place them in the lower grade levels.

25.15% had them in kindergarten
28.65% had them in grades 1-3
26.90% had them in grades 4-6
19.30% had them in grades 7-9
18.13% had them in grades 10-12

The computer lab was a different story. Except for kindergarten, the majority of schools had them at every grade level. Even for kindergarten, 42.12 percent provided such labs.

Grades 1-3	60.82%
Grades 4-6	84.21%
Grades 7-9	75.44%
Grades 10-12	77.78%

Access to the Internet was not widespread. A majority of school districts provided it only for grades 10-12. The results are:

Kindergarten	21.05%
Grades 1-3	25.15%
Grades 4-6	31.58%
Grades 7-9	47.37%
Grades 10-12	53.22%

The next section dealt with the familiarity of school personnel with the Internet. A majority reported that they were familiar with the Internet, with only 5.85 percent reporting no familiarity whatsoever. An overwhelming majority reported user ease in attaining Internet resources, with only 7.02 percent reporting no such ability.

Respondents were questioned about their ability to "surf the net". When asked about the various programs used in navigating the Internet, these were the results:

1. Regarding Netscape, a graphical browser provided free of charge to educators, only 14.62 percent reported that they were familiar with it, while 53.8 percent reported various states of unfamiliarity with it, and 34.50 percent stated none at all.

2. Regarding Fetch, a file transfer protocol program, the results faired worse. Only 1.17 percent reported high familiarity while 82.0 percent were comparatively unfamiliar and 64.91 percent not at all familiar.

3. Mosaic, another graphical browser, did not do much better. Only 5.85 percent were very familiar, with the overwhelming

majority reporting unfamiliarity, and 47.37 percent having no knowledge at all.

4. Gopher did a lot better with respondents in the field. Thirty-six percent reported familiarity with 11.70 reporting high familiarity although 38.01 percent said they had none.

Electronic mail (E-mail) received a mixed bag of reviews. The majority of responses indicated some familiarity with Electronic mail and 27.08 percent reported high familiarity. Only 8.33 percent reported a total lack of knowledge. Use was a different story as the following chart will bear out:

Use of E-mail at Home

Frequency	Percent
Daily	7.93
Three times a week	3.13
Once a week	4.69
Once a month	4.69
Not at all	80.21

By a small margin, 42.08 percent to 47.92 percent, respondents reported that their school district did not use E-mail. However, the frequency of use was far and above personal utilization.

Use of E-mail in School Office

Frequency	Percent
Daily	22.92
Three times a week	5.73
Once a week	5.73
Once a month	2.60
Not at all	63.02

APSCN did rather well. Seventy-four percent of the respondents reported some familiarity with it. Only 3.65 percent claimed to know nothing about it. The identity of the school employee who returned data from APSCN bears out the responses to the first question.

Retrieval of Information from APSCN

Person	Percent
Superintendent	47.92
Principal	33.85
Media Specialist	32.29
Students	13.54

(The percentages add up to more than 100 because of use by more than one position.)

The respondents were then asked about an Internet homepage. Only 30.70 percent claimed knowledge with and 17.19 percent claimed that they were not at all familiar with a homepage. Oddly enough, though 48.44 percent said they were undecided, half of the respondents wanted a homepage. Evidently these folks fall in

the category of one-upmanship. If they can have a "whatever it is", we need one too.

When asked if they would like to communicate with other school districts over the Internet, some 77 percent agreed or strongly agreed. None strongly disagreed. This was the second most popular item in the survey.

The superintendents were then asked to respond as to whether they knew what a Listserv was. Among those superintendents 12.5 percent said that they were familiar, but two-thirds reported a lack of knowledge with 51.04 percent admitting complete ignorance.

Respondents were then queried as to whether their school library was computerized. Affirmative answers constituted 60.94 percent. When asked about hourly personnel qualified to instruct students on how to use the Internet, 53.13 percent said yes.

It would seem that the Internet has received sufficient publicity and interest. The last item wanted to know whether the superintendents thought that access to the Internet for educational purposes was important to their school. Although 13.56 percent reported themselves as undecided, some 86.46 percent agreed on its importance. This was the most broadly accepted item. No one disagreed.

As a final note, districts were asked what functions in the schools were computerized. Winners were financial records, libraries, and student records.

Analysis of Data

All of the questions requiring answers to familiarity or agreement were subjected to a one-tailed t test and were significant beyond the .01 level of confidence.

It would seem that the computer is indeed being welcomed by Arkansas schools and most are either involved or wanting to be.

The survey indicates that use of computers in Arkansas schools is widespread. Although the placement of computers in classrooms seemed to be concentrated in K-6, computer labs seemed dispersed more evenly throughout the schools. The use of the Internet clustered around the upper grades (10-12).

Arkansas compares favorably with national trends. According to a report by the United States Department of Education, about 50 percent of the nation's schools are connected to the Internet. This survey indicates that about 53 percent of our schools are not only hooked up to the Internet, but that students are actively using Internet resources. Arkansas is making fine progress, but in an environment in which over 17 million American adults, or 1 in 11, have used Internet web pages, the state needs to continue its efforts just to remain competitive.

Conclusions for Arkansas

Recently, the State of Arkansas was given the dubious honor of being the only state in the union to receive the grade of F in its support of public schools. This adds weight to the proverbial albatross around the state's neck of not having an equitable school

funding law for public education. What does the current Governor, Mike Huckabee, of the State of Arkansas do at a time like this? He wants to give the citizens of our great state a tax break. Huckabee is in favor of giving monies back to the citizens of Arkansas instead of directing them to education - another in a series of Arkansas Governors for Public Education.

Arkansas is ahead of the national average for being connected to the Internet. The Internet is seen by some as being the great equalizer for schools. No one can argue that the Internet does contain a vast amount of important information. Sadly, though, many of the school districts who could benefit from having the ability to access the Internet simply cannot afford it. Stoll (1995), surmises,

> This hits rural school districts especially hard: few of the major communications suppliers have dial up modems outside of the cities. On top of the on-line fees, such schools must pay long distance access charges. In addition, school hours are during the daytime, so phone charges and on-line fees are the highest when classes are in session (p. 129).

Decision Making In Purchasing Technology

In Drucker's (1990) Managing the Non-Profit Organization, he describes decision making in the non-profit organization. These can very easily be transferred to education, but more specifically to technology in our public schools. All public school districts need to make a decision toward technology in their schools. The decision can be from how the technology is to fit into the curriculum to what type and how may computers to buy.

Drucker (1990) states, ". . .decisions always include risk taking" (p. 122). Purchasing technology is one of the most important and expensive decisions a school district will make.

Drucker (1990) lists three types of risks: First, he points out ". . .the risk we can afford to take. If it goes wrong, it is easily reversible with minor damage" (p. 123). This, sadly, is the mentality of some school officials. Purchase the equipment and we will worry about the software later. A computer is only as good as the software installed on the machines and the implementation of the product. Staff training is essential and will determine the success of the technology in the schools.

Second, Drucker ascribes to ". . .an irreversible decision, when failure may do serious harm" (1990, p. 123). Purchasing computers for a school district can easily fall into this category if the technology is purchased without a valid computer plan for the district. Computers are expensive. Responsible selection, integration, and training will lessen the possibility of having to replace the systems prematurely.

Drucker states that there is a third type of risk, ". . .where the risk is great but one cannot afford *not* to take it" (1990, p. 122). Public education has taken serious blows over the years. Education is a competitive discipline and no one wants to be considered the "worst" locally or nationally. Technology can allow school districts to play on a level playing field.

In Arkansas, we are one of the poorest states and have consistently rated low compared to national averages in education. This alone makes the risk of technology even greater. We cannot

afford not to purchase and integrate technology, and we cannot afford to make an irreversible mistake. We must make the initial purchase of technology one that allows us the least restrictions for upgrades in the future, changing teaching trends, and changes in the curriculum.

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